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Appendix 1

Glossary of Data Reporting Qualifiers

DATA QUALITY PARAMETERS

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

Due to method blank contamination, the radium-226 and thorium-228 result in samples J031Y6 were qualified as estimates and flagged "J".

All other blank results were acceptable.

Field (Equipment) Blank

One field blank (J031Y6) was submitted for analysis. Radium-228 and thorium-232 results were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as

Appendix 2

Summary of Data Qualification

- **Completeness**

Data package No. W04626 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The minor deficiencies were noted:

Due to method blank contamination, the radium-226 and thorium-228 result in samples J031Y6 were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (163%), all detected gamma spectroscopy results (except cesium-137 and radium-226) were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (55%), all uranium-235 results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01754, *Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the River Corridor Baseline Risk Assessment*, March 2005.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOLID MATRIX, (PCI/G) Page__1 of__2

Project: BECHTEL-HANFORD																					
Laboratory: STL																					
Case	SDG: W04626																				
Sample Number		J031Y6		J031Y7		J031Y8		J031Y9		J03200		J03201		J03202		J03203		J03204			
Remarks		E. Blank						Duplicate													
Sample Date		4/19/05		4/19/05		4/19/05		4/19/05		4/19/05		4/20/05		4/20/05		4/20/05		4/20/05			
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Americium-241(gea)	0.3	0.0173	U	0.0184	U	0.0440	U	0.0156	U	0.0143	U	0.0205	U	0.0186	U	-0.00922	U	0.0127	U		
Cobalt 60	0.05	0.000317	U	0.0213	U	0.00762	U	0.00619	U	0.0134	U	0.0478	J	0.0112	U	0.0356	U	0.0196	U		
Cesium 137	0.1	0.000680	U	0.420		0.257		0.262		0.204		0.381		0.376		0.206		0.246			
Europium 152	0.1	-0.0125	U	0.188	U	0.0931	U	0.134	U	0.135	U	0.349	J	0.158	U	0.149	U	0.145	U		
Europium 154	0.1	-0.00658	U	0.0519	U	-0.0127	U	0.00754	U	0.0243	U	0.0352	U	0.0276	U	0.0253	U	0.0445	U		
Europium 155	0.1	0.0210	U	0.00993	U	0.0563	U	0.0388	U	0.0514	U	0.0666	U	0.0427	U	0.0713	U	0.0793	U		
Radium-226	0.1	0.195	J	0.640		0.671		0.635		0.654		0.700		0.541		0.722		0.692			
Radium-228	0.2	0.140	J	0.667	J	0.863	J	0.814	J	0.856	J	0.942	U	0.559	J	1.16	J	1.19	J		
Thorium-228	0.2	0.195	J	0.628	J	0.924	J	0.859	J	0.784	J	0.839	J	0.624	J	1.05	J	1.10	J		
Thorium-232		0.155	J	0.682	J	0.906	J	0.887	J	0.648	J	0.838	J	0.578	J	1.02	J	1.08	J		
Thorium-234		0.823	U	1.97	U	2.85	U	0.670	U	1.49	U	2.08	U	1.22	U	1.64	U	-0.488	U		
Uranium-235(gea)		0.0184	U	0.0412	U	0.105	U	0.0375	U	0.0806	U	0.0718	U	0.0451	U	0.0317	U	0.0693	U		
Uranium-234	1	0.00976	U	0.379		0.390		0.403		0.402		0.539		0.128		0.529		0.576			
Uranium-235	1	0.00876	J	0.0119	J	0.0114	J	0.0153	J	0.0111	J	0.0173	J	0.00455	UJ	0.0116	UJ	0.0174	J		
Uranium-238	1	0.0163		0.293		0.343		0.395		0.312		0.470		0.118		0.444		0.473			
Strontium-89/90	1	0.0199	U	0.0451	U	0.0493	U	0.0490	U	0.0674	U	-0.113	U	0.259	U	0.109	U	-0.0361	U		

* - RQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

Project: BECHTEL-HANFORD																			
Laboratory: STL																			
Case	SDG: W04626																		
Sample Number		J03205		J03255															
Remarks																			
Sample Date		4/20/05		4/25/05															
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Americium-241(gea)	0.3	0.0411	U	0.0270	U														
Cobalt 60	0.05	0.00846	U	0.0356	U														
Cesium 137	0.1	0.408		0.676															
Europium 152	0.1	0.126	U	0.379	J														
Europium 154	0.1	-0.00724	U	0.0460	U														
Europium 155	0.1	0.0600	U	0.0450	U														
Radium-226	0.1	0.775		0.872															
Radium-228	0.2	0.852	J	0.715	U														
Thorium-228	0.2	0.877	J	0.655	J														
Thorium-232		0.738	J	0.625	J														
Thorium-234		1.14	U	0.255	U														
Uranium-235(gea)		0.0649	U	0.0392	U														
Uranium-234	1	0.384		0.461															
Uranium-235	1	0.00947	J	0.02390	J														
Uranium-238	1	0.341		0.456															
Strontium-89/90	1	0.0596	U	0.0247	U														

* - RQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

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Sample Results Summary

STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Date: 07-Jun-05

Report No. : 29086 **SDG No:** W04626A

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
5116478	UISO_IE_PLATE_AEA								
	J031Y6								
	G86VW1AA	U-234	9.76E-03 +- 8.0E-03	U	pCi/g	79%	9.76E-03	2.00E-02	
		U-235	8.76E-03 +- 6.8E-03	J	pCi/g	79%	3.39E-03	2.00E-02	
		U-238	1.63E-02 +- 1.1E-02		pCi/g	79%	1.35E-02	2.00E-02	
	J031Y7								
	G86V21AA	U-234	3.79E-01 +- 7.3E-02		pCi/g	89%	2.94E-03	2.00E-02	
		U-235	1.19E-02 +- 7.5E-03	J	pCi/g	89%	2.94E-03	2.00E-02	
		U-238	2.93E-01 +- 5.9E-02		pCi/g	89%	2.94E-03	2.00E-02	
	J031Y8								
	G86V71AA	U-234	3.90E-01 +- 7.5E-02		pCi/g	88%	9.18E-03	2.00E-02	
		U-235	1.14E-02 +- 7.6E-03	J	pCi/g	88%	7.37E-03	2.00E-02	
		U-238	3.43E-01 +- 6.7E-02		pCi/g	88%	9.68E-03	2.00E-02	
	J031Y9								
	G86WC1AA	U-234	4.03E-01 +- 7.8E-02		pCi/g	90%	7.67E-03	2.00E-02	
		U-235	1.53E-02 +- 9.0E-03	J	pCi/g	90%	7.67E-03	2.00E-02	
		U-238	3.95E-01 +- 7.7E-02		pCi/g	90%	5.75E-03	2.00E-02	
	J03200								
	G86WE1AA	U-234	4.02E-01 +- 7.9E-02		pCi/g	84%	8.17E-03	2.00E-02	
		U-235	1.11E-02 +- 7.6E-03	J	pCi/g	84%	3.33E-03	2.00E-02	
		U-238	3.12E-01 +- 6.4E-02		pCi/g	84%	6.13E-03	2.00E-02	
	J03201								
	G86R81AA	U-234	5.39E-01 +- 1.0E-01		pCi/g	88%	1.14E-02	2.00E-02	
		U-235	1.73E-02 +- 9.3E-03	J	pCi/g	88%	3.12E-03	2.00E-02	
		U-238	4.70E-01 +- 8.9E-02		pCi/g	88%	1.75E-02	2.00E-02	
	J03201 DUP								
	G86R81AC	U-234	5.94E-01 +- 1.1E-01		pCi/g	82%	1.12E-02	2.00E-02	9.8
		U-235	2.18E-02 +- 1.1E-02		pCi/g	82%	7.91E-03	2.00E-02	23.1
		U-238	4.77E-01 +- 9.1E-02		pCi/g	82%	1.35E-02	2.00E-02	1.6
	J03202								
	G86T11AA	U-234	1.28E-01 +- 3.2E-02		pCi/g	91%	2.14E-02	2.00E-02	
		U-235	4.55E-03 +- 6.6E-03	U J	pCi/g	91%	1.19E-02	2.00E-02	
		U-238	1.18E-01 +- 3.0E-02		pCi/g	91%	1.52E-02	2.00E-02	
	J03203								
	G86T71AA	U-234	5.29E-01 +- 1.0E-01		pCi/g	83%	1.90E-02	2.00E-02	
		U-235	1.16E-02 +- 9.1E-03	U J	pCi/g	83%	1.20E-02	2.00E-02	
		U-238	4.44E-01 +- 8.6E-02		pCi/g	83%	1.56E-02	2.00E-02	
	J03204								
	G86T91AA	U-234	5.76E-01 +- 1.1E-01		pCi/g	83%	2.03E-02	2.00E-02	

Sample Results Summary

Date: 07-Jun-05

STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 29086 **SDG No:** W04626A

Batch	Client Id / Work Order	Parameter	Result ± Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
5116478 UISO_IE_PLATE_AEA									
J03204									
	G86T91AA	U-235	1.74E-02 ± 9.4E-03	J	pCi/g	83%	3.13E-03	2.00E-02	
		U-238	4.73E-01 ± 9.0E-02		pCi/g	83%	1.42E-02	2.00E-02	
J03205									
	G86VC1AA	U-234	3.84E-01 ± 7.5E-02		pCi/g	87%	3.05E-03	2.00E-02	
		U-235	9.47E-03 ± 7.1E-03	J	pCi/g	87%	7.11E-03	2.00E-02	
		U-238	3.41E-01 ± 6.7E-02		pCi/g	87%	7.11E-03	2.00E-02	
J03255									
	G86WL1AA	U-234	4.61E-01 ± 9.3E-02		pCi/g	86%	8.20E-03	2.00E-02	
		U-235	2.39E-02 ± 1.3E-02	J	pCi/g	86%	9.75E-03	2.00E-02	
		U-238	4.56E-01 ± 9.3E-02		pCi/g	86%	8.20E-03	2.00E-02	

No. of Results: 36

6/27/05

Sample Results Summary

Date: 17-Jun-05

STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 29166

SDG No: W04626C

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
5161525	GAMMA_GS								
	J031Y6								
	HDEGJ1AA	AM-241	1.73E-02 +- 1.2E-02	U	pCi/g		1.89E-02		
		CO-60	3.17E-04 +- 5.8E-03	U	pCi/g		1.05E-02	5.00E-02	
		CS-137	6.80E-04 +- 5.9E-03	U	pCi/g		1.03E-02	1.00E-01	
		EU-152	-1.25E-02 +- 1.5E-02	U	pCi/g		2.49E-02	1.00E-01	
		EU-154	-6.58E-03 +- 2.1E-02	U	pCi/g		3.71E-02	1.00E-01	
		EU-155	2.10E-02 +- 1.6E-02	U	pCi/g		2.80E-02	1.00E-01	
		RA-226	1.95E-01 +- 3.6E-02	J	pCi/g		1.78E-02		
		RA-228	1.40E-01 +- 5.4E-02	J	pCi/g		3.98E-02		
		TH-228	1.95E-01 +- 4.4E-02	J	pCi/g		2.65E-02		
		TH-232	1.55E-01 +- 5.9E-02	J	pCi/g		5.70E-02		
		TH-234	8.23E-01 +- 1.1E+00	U	pCi/g		1.95E+00		
		U-235HP	1.84E-02 +- 3.5E-02	U	pCi/g		5.94E-02		
	J031Y6 DUP								
	HDEGJ1AC	AM-241	1.18E-02 +- 3.9E-02	U	pCi/g		6.55E-02		
		CO-60	-1.29E-03 +- 6.9E-03	U	pCi/g		1.21E-02	5.00E-02	
		CS-137	-6.05E-03 +- 5.7E-03	U	pCi/g		9.00E-03	1.00E-01	
		EU-152	2.26E-03 +- 1.5E-02	U	pCi/g		2.64E-02	1.00E-01	
		EU-154	-4.25E-03 +- 2.2E-02	U	pCi/g		3.94E-02	1.00E-01	
		EU-155	1.45E-02 +- 1.8E-02	U	pCi/g		3.20E-02	1.00E-01	
		RA-226	1.64E-01 +- 3.3E-02		pCi/g		1.92E-02		
		RA-228	2.03E-01 +- 5.0E-02		pCi/g		3.98E-02		
		TH-228	1.68E-01 +- 4.6E-02		pCi/g		2.68E-02		
		TH-232	1.51E-01 +- 5.7E-02		pCi/g		5.25E-02		
		TH-234	-1.52E-01 +- 9.9E-01	U	pCi/g		1.73E+00		
		U-235HP	-1.93E-02 +- 3.8E-02	U	pCi/g		6.02E-02		
	J031Y7								
	HDEGM1AA	AM-241	1.84E-02 +- 1.9E-02	U	pCi/g		3.03E-02		
		CO-60	2.13E-02 +- 1.2E-02	U	pCi/g		2.20E-02	5.00E-02	
		CS-137	4.20E-01 +- 5.6E-02		pCi/g		1.77E-02	1.00E-01	
		EU-152	1.88E-01 +- 4.7E-02	U	pCi/g		5.84E-02	1.00E-01	
		EU-154	5.19E-02 +- 3.6E-02	U	pCi/g		6.56E-02	1.00E-01	
		EU-155	9.93E-03 +- 2.6E-02	U	pCi/g		4.34E-02	1.00E-01	
		RA-226	6.40E-01 +- 8.8E-02		pCi/g		3.13E-02		
		RA-228	6.67E-01 +- 1.2E-01	J	pCi/g		6.38E-02		
		TH-228	6.28E-01 +- 1.0E-01	J	pCi/g		4.59E-02		
		TH-232	6.82E-01 +- 1.3E-01	J	pCi/g		9.42E-02		
		TH-234	1.97E+00 +- 1.7E+00	U	pCi/g		3.07E+00		

STL Richland

rptSTLRchSaSummary2 V4.13 A97

RPD - Relative Percent Difference.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

000017

6/22/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Sample Results Summary

STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Date: 17-Jun-05

Report No. : 29166

SDG No: WD4626C

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
5161525	GAMMA_GS								
	J03203								
	HDEG51AA	RA-228	1.16E+00 +- 1.8E-01	J	pCi/g		6.38E-02		
		TH-228	1.05E+00 +- 1.5E-01	J	pCi/g		5.25E-02		
		TH-232	1.02E+00 +- 1.9E-01	J	pCi/g		1.01E-01		
		TH-234	1.64E+00 +- 1.8E+00	U	pCi/g		3.16E+00		
		U-235HP	3.17E-02 +- 7.0E-02	U	pCi/g		1.16E-01		
	J03204								
	HDEG61AA	AM-241	1.27E-02 +- 4.8E-02	U	pCi/g		7.69E-02		
		CO-60	1.96E-02 +- 1.4E-02	U	pCi/g		2.55E-02	5.00E-02	
		CS-137	2.46E-01 +- 3.9E-02		pCi/g		2.09E-02	1.00E-01	
		EU-152	1.45E-01 +- 4.9E-02	U	pCi/g		6.38E-02	1.00E-01	
		EU-154	4.45E-02 +- 4.1E-02	U	pCi/g		7.31E-02	1.00E-01	
		EU-155	7.93E-02 +- 3.8E-02	U	pCi/g		6.16E-02	1.00E-01	
		RA-226	6.92E-01 +- 1.0E-01		pCi/g		3.53E-02		
		RA-228	1.19E+00 +- 1.9E-01	J	pCi/g		6.89E-02		
		TH-228	1.10E+00 +- 1.6E-01	J	pCi/g		5.45E-02		
		TH-232	1.08E+00 +- 2.1E-01	J	pCi/g		1.14E-01		
		TH-234	-4.88E-01 +- 1.9E+00	U	pCi/g		3.23E+00		
		U-235HP	6.93E-02 +- 6.9E-02	U	pCi/g		1.18E-01		
	J03205								
	HDEG91AA	AM-241	4.11E-02 +- 2.5E-02	U	pCi/g		3.69E-02		
		CO-60	8.46E-03 +- 1.1E-02	U	pCi/g		2.02E-02	5.00E-02	
		CS-137	4.08E-01 +- 5.6E-02		pCi/g		1.91E-02	1.00E-01	
		EU-152	1.26E-01 +- 4.3E-02	U	pCi/g		5.40E-02	1.00E-01	
		EU-154	-7.24E-03 +- 3.5E-02	U	pCi/g		6.01E-02	1.00E-01	
		EU-155	6.00E-02 +- 3.2E-02	U	pCi/g		5.37E-02	1.00E-01	
		RA-226	7.75E-01 +- 1.0E-01		pCi/g		3.06E-02		
		RA-228	8.52E-01 +- 1.4E-01	J	pCi/g		6.17E-02		
		TH-228	8.77E-01 +- 1.3E-01	J	pCi/g		4.80E-02		
		TH-232	7.38E-01 +- 1.5E+01	J	pCi/g		1.04E-01		
		TH-234	1.14E+00 +- 1.7E+00	U	pCi/g		2.97E+00		
		U-235HP	6.49E-02 +- 6.7E-02	U	pCi/g		1.12E-01		
	J03255								
	HDEHD1AA	AM-241	2.70E-02 +- 7.2E-02	U	pCi/g		1.21E-01		
		CO-60	3.56E-02 +- 1.4E-02	U	pCi/g		2.60E-02	5.00E-02	
		CS-137	6.76E-01 +- 9.1E-02		pCi/g		1.95E-02	1.00E-01	
		EU-152	3.79E-01 +- 7.2E-02		pCi/g		4.98E-02	1.00E-01	
		EU-154	4.60E-02 +- 3.9E-02	U	pCi/g		7.13E-02	1.00E-01	

STL Richland

rptSTLRchSaSummary2 V4.13 A97

RPD - Relative Percent Difference.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

000021 6/27/05

Sample Results Summary

Date: 17-Jun-05

STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 29166

SDG No: W04626C

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
5161525	GAMMA_GS								
	J03255								
	HDEHD1AA	EU-155	4.50E-02 +- 3.5E-02	U	pCi/g		6.13E-02	1.00E-01	
		RA-226	8.72E-01 +- 1.2E-01		pCi/g		3.10E-02		
		RA-228	7.15E-01 +- 1.4E-01	U	pCi/g		1.44E-01		
		TH-228	6.55E-01 +- 1.0E-01	J	pCi/g		5.12E-02		
		TH-232	6.25E-01 +- 1.4E-01	J	pCi/g		1.08E-01		
		TH-234	2.55E-01 +- 1.8E+00	U	pCi/g		3.12E+00		
		U-235HP	3.92E-02 +- 6.7E-02	U	pCi/g		1.11E-01		

No. of Results: 144

10/27/05

STL Richland

rptSTLRchSaSummary2 V4.13 A97

RPD - Relative Percent Difference.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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STL Richland
2800 George Washington Way
Richland, WA 99354

Tel: 509 375 3131 Fax: 509 375 5590
www.stl-inc.com

Certificate of Analysis

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

June 7, 2005

Attention: Joan Kessner

SAF Number	:	D05-003
Date SDG Closed	:	April 25, 2005
Number of Samples	:	Eleven (11)
Sample Type	:	Soil
SDG Number	:	W04626A
Data Deliverable	:	21-Day / Summary

CASE NARRATIVE

I. Introduction

On April 25, 2005, eleven soil samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the STLR identification numbers as described on the cover page of the Analytical Data Package report form. These samples were assigned to Lot Number J5D260174.

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was:

Alpha Spectroscopy
Uranium-234, -235, -238 by method RICH-RC-5079

Appendix 5

Data Validation Supporting Documentation

STL Richland
2800 George Washington Way
Richland, WA 99354

Tel: 509 375 3131 Fax: 509 375 5590
www.stl-inc.com

Certificate of Analysis

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

May 31, 2005

Attention: Joan Kessner

SAF Number	:	D05-003
Date SDG Closed	:	April 25, 2005
Number of Samples	:	Eleven (11)
Sample Type	:	Soil
SDG Number	:	W04626B
Data Deliverable	:	21-Day / Summary

CASE NARRATIVE

I. Introduction

On April 25, 2005, eleven soil samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the STLR identification numbers as described on the cover page of the Analytical Data Package report form. These samples were assigned to Lot Number J5D260178.

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was:

Gas Proportional Counting
Total Strontium by method RICH-RC-5006

IV. Quality Control

The analytical results for each analysis performed under SDG W04626B includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gas Proportional Counting
Total Strontium by method RICH-RC-5006:
The LCS, batch blank, samples and sample duplicate (J031Y7) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Sandra Legan

Becky Warrington
for Project Manager

STL Richland
2800 George Washington Way
Richland, WA 99354

Tel: 509 375 3131 Fax: 509 375 5590
www.stl-inc.com

Certificate of Analysis

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

June 17, 2005

Attention: Joan Kessner

SAF Number	:	D05-003
Date SDG Closed	:	April 25, 2005
Number of Samples	:	Eleven (11)
Sample Type	:	Soil
SDG Number	:	W04626C
Data Deliverable	:	21-Day / Summary

CASE NARRATIVE

I. Introduction

On June 6, 2005, a request was received to perform a recount of the gamma analysis for the eleven soil samples. Upon receipt, the samples were assigned the STLR identification numbers as described on the cover page of the Analytical Data Package report form. These samples were assigned to Lot Number J5F100329.

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was:

Gamma Spectroscopy
Gamma Spec by method RICH-RC-5017

IV. Quality Control

The analytical results for each analysis performed under SDG W04626C includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gamma Spectroscopy
Gamma Spec by method RICH-RC-5017
The Ra-228 recovery for the LCS was outside acceptance limits. The LCS was accepted based on the Cs-137 and Ra-226 recoveries. Except as noted, the LCS, batch blank, sample and sample duplicate (J031Y6) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

for Becky Warrington
Project Manager

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	RCBRA		DATA PACKAGE:	J09626	J09626
VALIDATOR:	TLT	LAB:	STL	DATE:	6/26/07
			SDG:	J04626	
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
J03146	J03147	J03148	J03149	J03200	J03201
J03202	J03203	J03204	J03205	J03255	
					Soil

1. Completeness ..... ☐ N/A

Technical verification forms present? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

Appendix 6

Additional Documentation Requested by Client

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Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

8. Tracer Recovery (Levels C, D, E) ..... N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

9. Matrix Spikes (Levels C, D, E) ..... N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

10. Duplicates (Levels C, D, E) .... ☐ N/A

Duplicates Analyzed at required frequency? .... (Yes) No N/A

RPD Values Acceptable? .... (Yes) No N/A

Transcription/Calculation Errors? (Levels D, E) .... Yes No (N/A)

Comments:

11. Field QC Samples (Levels C, D E) .... ☐ N/A

Field duplicate sample(s) analyzed? .... (Yes) No N/A

Field duplicate RPD values acceptable? .... (Yes) No N/A

Field split sample(s) analyzed? .... Yes (No) N/A

Field split RPD values acceptable? .... Yes No (N/A)

Performance audit sample(s) analyzed? .... Yes (No) N/A

Performance audit sample results acceptable? .... Yes No (N/A)

Comments: no FS or PAs

Y 8/49 —jc

12. Holding Times (All levels)

Are sample holding times acceptable? .... (Yes) No N/A

Comments:

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses?	(Yes)	No	N/A
Results supported in raw data?(Levels D, E)	Yes	No	(N/A)
Results Acceptable? (Levels D, E)	Yes	No	(N/A)
Transcription/Calculation errors? (Levels D, E)	Yes	No	(N/A)
MDA's meet required detection limits?	(Yes)	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments:_____

_____

_____

_____

_____

Appendix 6

Additional Documentation Requested by Client

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QC Results Summary

STL Richland STLRL

Ordered by Method, Batch No, QC Type,.

Date: 07-Jun-05

Report No. : 29086

SDG No.: W04626A

Batch / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC/MDA
UISO_IE_PLATE_AEA								
5116478 BLANK QC								
G877G1AA	U-234	-7.60E-04 +- 1.5E-03	U	pCi/g	86%			7.99E-03
	U-235	0.00E+00 +- 3.1E-03	U	pCi/g	86%			3.43E-03
	U-238	2.53E-03 +- 3.6E-03	U	pCi/g	86%			3.43E-03
5116478 LCS								
G877G1AC	U-234	1.39E-01 +- 3.5E-02		pCi/g	92%	99%	0.0	3.19E-03
	U-235	3.53E-03 +- 4.1E-03	U	pCi/g	92%	55%	-0.5	3.19E-03
	U-238	1.40E-01 +- 3.5E-02		pCi/g	92%	95%	-0.1	3.19E-03

No. of Results: 6

QC Results Summary
STL Richland STLRL

Ordered by Method, Batch No, QC Type,.

Date: 07-Jun-05

Report No. : 29086

SDG No.: W04626A

Batch / Work Order	Parameter	Result ± Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC|MDA
UISO_IE_PLATE_AEA								
5116478 BLANK QC								
G877G1AA	U-234	-7.60E-04 +- 1.5E-03	U	pCi/g	86%			7.99E-03
	U-235	0.00E+00 +- 3.1E-03	U	pCi/g	86%			3.43E-03
	U-238	2.53E-03 +- 3.6E-03	U	pCi/g	86%			3.43E-03
5116478 LCS								
G877G1AC	U-234	1.39E-01 +- 3.5E-02		pCi/g	92%	99%	0.0	3.19E-03
	U-235	3.53E-03 +- 4.1E-03	U	pCi/g	92%	55%	-0.5	3.19E-03
	U-238	1.40E-01 +- 3.5E-02		pCi/g	92%	95%	-0.1	3.19E-03

No. of Results: 6

QC Results Summary
STL Richland STLRL

Date: 01-Jun-05

Ordered by Method, Batch No, QC Type,.

Report No. : 29035

SDG No.: W04626B

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC|MDA
SRTOT_SEP_PRECIP_GPC								
5116480 BLANK QC								
G877M1AA	STRONTIUM	-1.17E-02 +- 1.5E-01	U	pCi/g	93%			3.71E-01
5116480 LCS								
G877M1AC	STRONTIUM	3.06E+00 +- 8.9E-01		pCi/g	88%	90%	-0.1	3.60E-01

No. of Results: 2

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

QC Results Summary
STL Richland STLRL

Ordered by Method, Batch No, QC Type,.

Date: 17-Jun-05

Report No. : 29166

SDG No.: W04626C

Batch / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC/MDA
GAMMA_GS								
5161525 BLANK QC								
HDETR1AA	AM-241	1.34E-03 +- 7.4E-03	U	pCi/g				1.11E-02
	CO-60	-3.18E-04 +- 3.7E-03	U	pCi/g				6.78E-03
	CS-137	1.33E-03 +- 3.9E-03	U	pCi/g				7.22E-03
	EU-152	-5.05E-04 +- 9.7E-03	U	pCi/g				1.69E-02
	EU-154	-4.10E-03 +- 1.0E-02	U	pCi/g				1.82E-02
	EU-155	3.72E-03 +- 9.2E-03	U	pCi/g				1.61E-02
	RA-226	9.16E-02 +- 2.0E-02		pCi/g				1.19E-02
	RA-228	4.96E-02 +- 2.3E-02	U	pCi/g				3.83E-02
	TH-228	3.94E-02 +- 1.8E-02		pCi/g				1.66E-02
	TH-232	5.74E-02 +- 2.6E-02	U	pCi/g				4.61E-02
	TH-234	5.84E-01 +- 5.7E-01	U	pCi/g				1.14E+00
	U-235HP	1.11E-03 +- 2.1E-02	U	pCi/g				3.63E-02
5161525 LCS								
HDETR1AC	CS-137	2.74E-01 +- 4.8E-02		pCi/g		101%	0.0	2.83E-02
	RA-226	9.58E-01 +- 1.4E-01		pCi/g		83%	-0.2	4.91E-02
	RA-228	2.01E+00 +- 3.0E-01		pCi/g		163%	0.6	8.53E-02
	TH-228	1.76E+00 +- 2.4E-01		pCi/g				7.14E-02
	TH-232	1.93E+00 +- 3.5E-01		pCi/g				1.56E-01
	TH-234	2.89E+00 +- 2.5E+00	U	pCi/g				4.40E+00
	U-235HP	5.44E-03 +- 8.8E-02	U	pCi/g				1.49E-01

No. of Results: 19